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ABSTRACT

Factors that affect the implementation of information-based improvements in college instruction and decision-making are considered, based on a conceptual scheme for comparing information-based change efforts. Based on a student outcomes project, eight brief case studies of public colleges illustrate different patterns leading to successful use of assessment information to induce change. Obstacles for using effectiveness information are identified, along with the broad role of information in college decision-making. To assess information-based change efforts, the following types of variables are important: the structure and process of institutional decision-making; the use of information in decision-making; and strategies employed to induce change based on assessment information. Specific variables include: institutional type and mission, school size, array of programs, locus of decision-making; resource flexibility, the quality and extent of available information, pressure for information use by top administrators, utilization of unit resources, and the integration of the change effort with ongoing activities. Appended are interview questions used in the National Center for Educational Management Systems Student Outcomes Project, along with a description of the format for reporting campus activities. Eight pages of references conclude the report. (SW)

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Effectiveness Information and Institutional Change: An Exploratory Analysis

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National Center for Higher Education Management Systems

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Effectiveness Information and Institutional Change:
An Exploratory Analysis

Introduction

A primary objective of all college and university administrators is to increase the effectiveness of undergraduate instruction. Recently, calls for improvement in this arena are many, and include such national reports as NIE's Involvement in Learning (1984), AAC's Integrity in the College Curriculum (1985), and SREB's Access to Quality Undergraduate Education (1985). A fundamental assumption in all these reports, however, is that explicit information about student performance in attaining instructional objectives is a crucial starting point for academic improvement. Following this logic, a number of states and accrediting bodies have recently changed their accountability and resource allocation mechanisms (see, for example, Bogue and Brown 1982, Folger 1984, Ewell 1985, SACS 1984, Thrash 1984).

Past experience, however, suggests that most colleges and universities face formidable organizational obstacles in attempting to implement information-based improvements in instruction and decisionmaking. The reasons for this are several, and involve two kinds of difficulties. A first set of problems arises from the place of undergraduate education in most colleges and unversities, and from the uncertain legitimacy of educational assessment and measurement. A second set of problems is more general, and concerns the nature of information itself as an ingrediant of decisionmaking in higher education settings. Both sets of problems have a considerable bearing on the degree to which information-based change strategies, as are currently being proposed, can in fact be successfully implemented.

Four Obstacles to Change

In order to analyze the success of a change effort, it is first necessary to identify what stands in its way. Both past research and accumulated institutional experience suggest four basic obstacles to using effectiveness information as a lever for improvement in undergraduate instruction.

First, institutions often lack a clear commitment to high quality undergraduate education (NIE 1984). Institutional mission statements, particularly for public institutions, are broadly constructed, and undergraduate instruction is only one of many identified priorities (Wallace 1985). In the case of large, multi-purpose research universities, this phenomenon is expected, and is perhaps appropriate. But in smaller, regional public institutions where undergraduate education arguably should be paramount, it also lacks priority (Birnbaum 1985). As a result, even where information on instructional effectiveness is available, it is not clear that it will automatically be used to improve instruction.

Secondly, at most institutions there is a tendency toward fragmented responsibility for undergraduate education. This is particularly true in the area of general education, where there is usually no single office or individual responsible for coordinating and monitoring actions to improve student success. In part, this weakness is a result of typically strong departmental structures and their associated disciplinary cultures (Clark 1983). General education usually occupies a low priority in relation to the academic major, responsibility for which is centered in individual departments or academic units (Gamson and Associates 1984). Even when administrative responsibility for general education is located in a specified unit (for

example, a general college or a division of general studies) this unit is often regarded as "second class" and is shunned by discipline faculty.

The typical division of labor between academic affairs and student affairs functions is also problematic for systematic change. Faculty, particularly in larger institutions, tend to abdicate responsibility for wholistic intellectual development in the belief that this is being professionally handled elsewhere (Astin 1985). This is despite considerable evidence that high quality faculty/student interaction has a broad range of positive developmental effects on students (for example, Feldman and Newcomb 1969, Astin 1977, and Terenzini and Pascarella 1977). Student service professionals, at the same time, have tended to develop services and activities in isolation from other parts of the institution. As a result, programs and policies of academic and student affairs offices are rarely discussed and developed in concert. Effectiveness information that speaks to the impact of the instructional environment as a whole thus will often have nowhere to go.

Thirdly, concrete incentives for using effectiveness information in any decision forum are generally lacking. Academic budgeting processes remain largely based on instructional volume rather than on the outcomes of instruction (Bowen 1978). This is partly a product of public sector funding practices that allocate the bulk of an institution's resources on the basis of enrollment-driven funding formulas (Brinkman 1984, Jones 1985). Unit-level administrators see substantial rewards for increased enrollment and teaching volume, and they structure their own budgetmaking practices accordingly. Most private institutions exhibit similar behavior: units that generate substantial income are rewarded, and income is in most cases tied to enrollment. In such a

climate, information on effectiveness is a luxury rather than a decisionmaking necessity.

Finally, the nature of information about instructional effectiveness itself creates difficulties of application in most college and university settings (Ewell 1982). A first difficulty is purely cultural: many of the presumed outcomes of higher education are held to be in principle unmeasurable, and attempts to gather and use effectiveness information are resisted purely on this basis. A second problem is disagreement about what to measure. The intended outcomes of higher education are remarkably diverse, and vary markedly across institutional types (Pace 1979, Pascarella 1985). A third problem is the fact that information on student learning and development really is more complex than the kinds of information routinely used by academic administrators in making day-to-day decisions (Pace 1985). Because such information is collected indirectly through a variey of measurement instruments, rather than being directly observed, and because the technology of educational measurement often involves the use of techniques that are not immediately "face-valid" to decisionmakers, the difficulties of translating measurement data into usable information can be formidable (Jones 1982). Perhaps most importantly, information on educational outcomes rarely directly tells decisionmakers what actions to take. Unlike the types of information that decisionmakers are accustomed to handling, it is difficult to direcly link a particular finding from an effectiveness study to a particular institutional policy or program that needs changing (Ewell 1984a). Such data more often will highlight the presence of a problem, will provide context for a range of decisions, or will serve as a stimulant for discussion or action (Ewell and Chaffee 1984).

The Broader Role of Information in Decisionmaking

These largely operational points raise a range of broader questions about the role of concrete information in the higher education decisionmaking process. Considerable past research points to the fact that the utilization of evaluation information of all kinds can vary considerably across different organizational settings and across different types of decisionmakers. In higher education, for example, past research has demonstrated that the role played by information may depend upon such factors as the formal organization of decisionmaking (Coleman 1972), the political positions of those generating and using the information (Baldridge 1971), or the general culture of decisionmaking (Chaffee 1983). In addition, the disciplinary backgrounds of college and university decisionmakers, particularly academic decisionmakers, may profoundly affect the perception and use of explicit assessment information. Studies that examine disciplinary background and decisionmaking style, for example, suggest that decisionmakers whose academic training was in different fields may perceive and use quantitative data quite differently (Mitroff 1982). At the same time, studies that investigate the role of individual cognitive styles in the perception and use of decision information suggest similar variability (for example, McKenney and Keen 1974).

A second set of issues surrounds the manner in which concrete information actually enters the decision process. Most formal treatments of the role of information in decisionmaking are based on a rational model of organizational process. According to this model, those who make decisions seek information in order to clarify the probable consequences of alternative future courses of action. Possession of information, while it cannot make the decision, can reduce uncertainty about which alternatives show the greatest potential benefit

while incurring the least cost (Raiffa 1968). Many constraints operate on this notion in practice, however, and tend to highlight the "non-rational" uses of information in decisionmaking. For example, Ewell and Chaffee (1984) identify four such constraints in college and university settings--(1) constraints of incomplete information, (2) political constraints, (3) constraints of organizational culture, and (4) constraints imposed by the need for the organization to take unambiguous action. Some of the "non-rational" uses of information that they observed included the role of explicit performance data in focusing attention on a neglected issue, in "selling" a decision previously arrived at on other grounds, and in inducing concrete action.

Many of these uses are explored in the wider literature on organizational behavior. Information may, for example, serve as a "signal" to outside constituents that an organization is rationally (and therefore appropriately) administered (Feldman and March 1981). Negative information in particular can serve to focus administrator attention--in itself a scarce organizational resource (March 1982, Braskamp and Brown 1980). Finally, information may be most effective in its role of promoting agreement and consensus so that consistent organizational action is possible. For example Brunsson (1982) documents several cases where the primary role of information was to mobilize the organization to take an action--any action--rather than to help leaders decide among a set of posed alternatives.

Many of these dynamics are also observable in the history of explicit information utilization projects in higher education. For example, in one such project the utilization of institutional planning and management information depended upon perceived linkages between planning information and visible, unit-level problems (Baldridge and Tierney 1979). In another project that

attempted to apply information on student learning and development to curriculum decisions, utilization was often blocked by differences among disciplinary cultures, and by the perceived symbolic role of the information provided (Astin 1976).

A third set of issues concerns the manner in which information is collected and communicated to decisionmakers. Past research on knowledge utilization suggests that the successful application of knowledge requires the simultaneous presence of a number of conditions. First, the information must have a visible bearing on an actual perceived problem. Information utilization in this sense never takes place in the abstract. Secondly, there must be a constant and consistent dialogue between those who gather and provide information and those who must use it. With regard to the first condition, Rogers and Shoemaker (1971) describe five stages through which a decision to adopt an innovation must pass. Similarly, Lazarsfeld and Reitz (1975) describe a cyclical "map" of knowledge utilization that stresses the manner in which decision information is rooted in and must make constant reference to an explicit problematic situation. The close ties between utilization and concrete problems is also a strong theme in the evaluation literature. For example, Patton (1978) and Coleman (1972) stress that decisionmakers are willing to make use of evaluation data that is seen as problem-related, even if they are aware that it is of questionable accuracy.

Moreover, the ways in which information is actually presented to decisionmakers can deeply influence whether or not it is used. Evidence from the evaluation literature, for example, suggests that the language in which a particular problem is expressed, and the visual forms in which data are presented can have a considerable impact on its credibility (Newman, Brown and Braskamp 1980,

Stufflebeam 1971, Anderson and Ball 1978, Havelock 1973). Futhermore, as Boland (1980) stresses, available information defines the character of decisionmaking itself. The kinds of information collected, maintained and visibly disseminated play an important part in defining the official "language" of an organization.

In higher education, these issues have been discussed by those interested in the rational use of information in policymaking (Schmidtlein 1977, Jones 1982), and by those interested in the intereaction between modes of information presentation and cognitive style (Hackman 1983). In examining the process of using information on student outcomes, for example, Kinnick notes both "organizational" and "technical" obstacles to utilization (1985). Among the former are lack of organizational access to information, lack of an appropriate organizational framework for integrating information from different sources and of different kinds, limited incentives to seek out and use information, and lack of established channels of communications between those who develop, manage, and use information. Among the "technical" factors identified are excessive bulk in reporting, organizing presentations around discrete data collection efforts rather than around issues or problems, lack of data integrity, lack of face validity, inadequate timeliness, and limited data interpretability. Strategies for overcoming some of these obstacles in the realm of data communication included graphic presentation, iterative release of information, and redundant data presentation strategies.

A Conceptual Scheme for Comparing Information-Based Change Efforts

As the above review suggests, accounting for the success or failure of information-based instructional improvement efforts is bound to be complex.

Making sense of it demands proceeding on conceptual and observational fronts simultaneously. The balance of this section presents a detailed conceptual framework for beginning to diagnose such efforts. The section that follows attempts to apply this approach to a range of actual cases where assessment information was used as a conscious change agent.

A major difficulty in evaluating such efforts to date, however, is their relative scarcity, and the fact that individual efforts have grown up in isolation from one another. Three past multi-institutional projects stressing the use of student outcomes information are worth noting--an eight-institution project on retention data undertaken by the Higher Education Research Institute at UCLA (Kemerer, Baldridge and Green 1982), a seven-institution project on student outcomes information sponsored by the W. K. Kellogg Foundation through the National Center for Higher Education Management Systems (Ewell 1984b), and an eight-institution FIPSE project on the use of "value-added" information in institutional decisionmaking (Astin 1984). In addition, several institution-specific studies of the use of student assessment data have become available. Among these are studies of small private colleges (for example Mentkowski and Doherty 1984, Mentkowski and Loacker 1985), studies of major research universities (for example Banta 1985a, Banta 1985b, Wallace 1985), and studies of regional public comprehensive universities (for example McClain and Krueger 1985, McClain 1984, Dumont and Troelstrup 1981). Evidence provided by these examples suggests that the presence of assessment information in the institutional decisiomaking process can have a major role in the direction of policy, but that general understanding of how the utilization process works and what makes it effective remains limited. This evidence does, however, provide an initial basis for constructing a conceptual scheme for comparing,

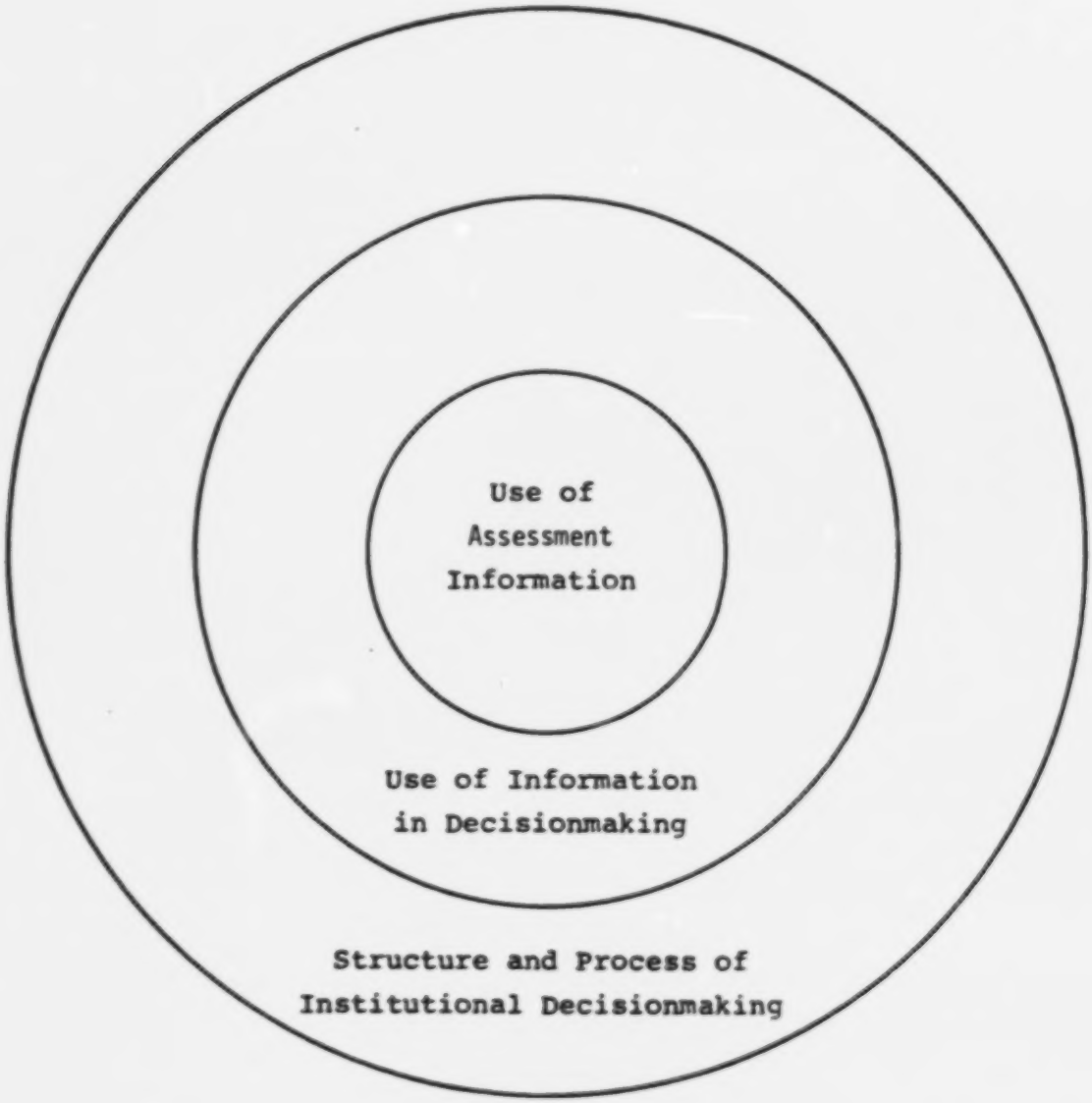
contrasting, and judging the success of information-based instructional improvement efforts.

Three Layers of Context for Information-Based Change Efforts

One way of beginning the construction of such a scheme is to recall several successive layers of obstacles noted in the literature review above. A first layer has to do with issues unique to student assessment information, and unique to the problem area of improving undergraduate instructional effectiveness. Such issues include the particular problems of measurement and communication associated with information on student learning and development, and the organizational difficulties that on most campuses surround the delivery of and responsibility for undergraduate general education. A second type of problem, in contrast, concerns information utilization in general, and how information of all kinds is collected, disseminated, and used in decisionmaking. Such issues include the organizational locus and control of information, the kinds of information regularly collected and communicated, and the kinds of decision situations in which information is regularly used. A final layer of problems has to do with the actual character of decisionmaking. Issues here include its relative centralization or decentralization, the kinds of issue-areas present for decisionmaking, the "rationality" the decision process, and its patterns of regularity and formality. Each of these layers of issues, of course, is related, and each tends to encompass and constrain the one within it (Figure 1). Together, however, they constitute and structure a functioning "environment" within which individual campus-based change efforts must operate.

Figure 1

Environments for Information-Based Change Efforts



This simple conception raises a number of basic questions about the process of information-induced change. These questions can, in turn, serve as a basis for organizing and comparing quite different bodies of institutional experience:

1. What are the primary variables that operate within and that have a demonstrable effect on each "layer" of environment? What major factors, for example, condition the way in which all decisions appear to be made at the institution? What determines or conditions the availability of decision information of differing kinds, and the ways in which such information is used in different settings? Finally, what especially conditions or determines the use and availability of information on instructional effectiveness--a particular species of decision information?

2. What kinds of interactions occur among these different "layers" of environment? How do these interactions, if they are present, shape the processes that occur at each stage of the information utilization process? Are there, for example, institutional "syndromes" that link particular patterns of decisionmaking with particular types of information use? If such patterns or syndromes exist, it may be useful to broadly distinguish among a few broad classes of institutions within which quite different approaches to information-based change are appropriate.

3. Given different environments, what kinds of explicit change strategies seem to be most effective in what kinds of situations? This, of course, is the ultimate policy question, and can only be answered once a great deal of information on different institutional experiences is

collected. But case study work can begin to chart the directions for more systematic future work in this arena.

These three broad questions frame a considerable research agenda, and the ingredients for undertaking only the initial stages are currently available. Making a start now, however, may be of considerable benefit in guiding future efforts.

A Catalogue of Key Variables

Given a multi-contextual functioning environment for information-based change efforts, a first analytical task is to begin to explicitly identify the principle factors that affect utilization efforts within each layer of context. To the extent that such factors can be identified and compared, particular institutional experiences can be placed in their proper environmental setting, and inappropriate generalizations to other settings can potentially be avoided. The following catalogue of key variables represents a first attempt at accomplishing this task. Three basic classes of variables are identified--(1) variables affecting the structure and process of institutional decisionmaking, (2) variables affecting the use of information in decisionmaking , and (3) variables describing the kinds of strategies employed to induce change based on assessment information. Variables included under each heading are briefly discussed below.

A. Institutional Context: The Structure and Process of Institutional Decisionmaking

Variables included under this heading correspond to the broad decisionmaking environment present at the institution. The results of otherwise similar improvement activities may be vastly different given the

different contexts set by these important groups of "control" variables. Such general environmental variables include the following:

1. Institutional "Demographics"

   - The Type and Mission of the Institution. This includes the institution's basic type (community college, regional, comprehensive, research center, etc.) as well as any distinctive elements of mission which the institution may stress (agricultural/technical, regional service, etc.).

   - The Size of the Institution. Size may be described in many ways, but for current purposes, institutions differ primarily in the number of students served, the number of distinct programs offered, the complexity of the administrative structure, and the level of available resources.

   - The Institution's Array of Programs. This includes the number of programs offered, the levels at which they are offered, and the number of distinct fields in which programs are offered.

   - Student Body Characteristics. This includes most of the primary demographics of the student body (age, employment, minority status, residence), their academic aptitudes, their academic goals, and their enrollment characteristics (full-time, evening, degree-seeking, etc.).

   - Relative Stability. This refers to the degree to which the above characteristics have remained relatively stable over time.

2. Centralization of Decisionmaking. These variables refer to the actual process of decisionmaking on campus. Is the decisionmaking process for the most part a participatory and decentralized process, or is it concentrated at the upper administrative levels? Or does this depend upon the type of decision? In general, two kinds of factors need to be distinguished:

   - The "Mission Solidarity" of the Institution. This refers to the degree to which all decisionmakers at the institution feel that they are trying to accomplish the same thing. To the extent that this is present, actual decisionmaking may be highly decentralized in practice, with little risk that incongruent or inconsistent decisions will be made.

   - The Locus of Decisionmaking. This refers to the actual physical location of different kinds of decisions. In this context the formal decisionmaking system must be distinguished from the informal settings in which it operates. In addition, the degree to which decisions are delegated may be different in different issue areas.

3. Institutional Flexibility. These variables refer to the degree to which the institution is able to take independent action to solve its problems and to improve its programs. In general, three factors should be distinguished:

   - Decision Latitude. This refers to the relative ability of the institution to take action independent of its external governing bodies. How is the institution constrained in what it can do because

of policies or procedures requiring approval or clearance from higher authorities?

- Resource Flexibility. This refers to the institution's relative ability to reallocate resources (financial, human and physical) to meet new needs. If the institution is financially constrained, resource flexibility will probably be at a minimum. At the same time, substantial resource inflexibility may still exist even if resources themselves are relatively plentiful.

- Orientation Toward Risk and Innovation. This refers to the history and style of the institution in dealing with risk or uncertainty. Is the general pattern to consciously innovate, or to attempt to control the environment in order to preserve relatively established ways of doing things? Will new initiatives be seen primarily as a threat or as an opportunity?

B. Use of Information in Decisionmaking

Variables included under this heading consist of those that influence the inner two "rings" of environmental context for information-based change efforts. Essentially, the same set of questions can be asked about the institution's general use of information in decisionmaking, and about the use of information on instructional effectiveness. But it is important to explicitly ask these questions at both levels. Appropriate change strategies may well be quite different if the challenge is to move a particular campus toward information-centered decisions in general, rather than to include instructional assessment information in an existing

decision process that already recognizes the legitimacy of information-based decisionmaking. Several factors are important here:

1. The Quality and Extent of Available Information. Use of information in decisionmaking will first depend upon the range and adequacy of the information available. Both for information in general and for information on student learning and development, the particular types of information available need to be identified and assessed in terms of their frequency of collection and in terms of their general quality (validity, reliability, applicability to institutional problems).

2. The Locus and Control of Information. The availability of decision information is also a function of who collects it, of who keeps it, and of what policies exist for maintaining and disseminating it. For both general decision information and for student outcomes information, the following dimensions need to be considered:

   - Information Centralization. This refers to the degree to which information collection is centrally organized or is dispersed among the various units in the institution. What particular areas of decision information are centralized? How uneven is the information collection process among units across the institution? Do the content of unit information bases and central information bases differ substantially and in what areas?

   - Information Dissemination/Availability. This refers to the relative accessibility of information once collected. Is information tightly held by those who collect it, or is it widely shared with others in the institution? Are these patterns different for different units

and for different kinds of information? What units have explicit responsibility for information dissemination and how do they execute this responsibility?

3. Receptivity of Decisionmakers. These variables govern the "listener" side of the data communication problem. At the broadest level, two kinds of considerations are relevant:

   - The General Cognitive Style of Decisionmakers. This refers to decisionmakers' general approach to the use of information. Information may be extensively used to explore different decision alternatives and to weigh their relative merits. It may be used to justify previously taken decisions or as a weapon in the organizational bargaining process. Finally, it may be tightly or loosely held once acquired.

   - The Use of Specific Kinds of Information. Although they may share a general attitude toward information, particular decisionmakers may have quite different attitudes toward the utility of particular kinds of information. Despite a positive general attitude toward information, some may find data on instructional effectiveness to be entirely irrelevant to the management problem. Others may be positively attracted to information about what students are learning, despite a generally non-rational approach to using information in decisionmaking.

4. Pressure for Information Use by Top Administrators. Independent of any of the above, the use of information in decisionmaking will be affected by the resolution of top administrators to enforce information use.

Aside from the degree or level of pressure present in the situation, three other factors should be considered:

- Nature of Incentive. This refers to whether the incentives provided for information use are positive or negative. Are units rewarded for using information in decision processes or are they directed to use information regardless of their own feelings as to its appropriateness?

- Delegation of Authority. This refers to the degree to which monitoring and enforcing information use is kept as a top-level function or is formally or informally delegated.

- Degree of Follow-Up. This refers to the way compliance or non-compliance in using information is handled by the institution. Are unit responses to information-use initiatives carefully evaluated and followed up, or is the process a more informal and evolutionary one?

C. Change Strategy Dimensions

While the variables outlined in the previous section condition the success of particular information-based change efforts, those outlined below constitute the actual structure of such initiatives. The first set comprises environmental factors which are relatively fixed and to which particular change strategies must adapt. The second set, on the other hand, constitutes a range of choices. Which choices are most effective and most appropriate given a particular array of environmental conditions is, of course, the primary policy question for most administrators.

1. Characteristics of the Unit Acting as "Change Agent"

The choice of where in the institution to locate responsibility for a change project is fundamental. Inevitably, actions undertaken by this unit in support of the project will be seen as actions by the unit itself. They will also be influenced by the relative position of the unit in the decision structure, its communication links with other units, and its perceived goals and function within the institutional community. Several dimensions of unit context are worth explicit consideration:

- Proximity to the Locus of Decision. This refers to the distance between the unit primarily responsible for using information to initiate change and the locus of decisionmaking in the institution. Is the unit responsible itself a decision unit, or is it a support unit? If a decision unit, what kinds of decisions does it directly influence, participate in, or determine? What kinds of decisions are excluded from its domain?

- Unit Resources Available. This refers to the particular resources that the unit can bring to bear directly upon the project. These include particular skills and experience, particular sources of data, particular types of access to communications channels, and so on. These also include the kinds of external resources that the unit can mobilize to support the effort, such as grant assistance, consulting, or high visibility for the initiative.

- Unit Resources Utilized. This refers to the degree to which the above resources are actually utilized in support of the change

effort. To what extent do other unit objectives consume resources which might have been devoted to accomplishing improvement or information use objectives? Or, on the other hand, to what extent does attainment of related unit objectives help also to accomplish the objectives of the change initiative?

- Stability of Primary Actors. This refers to the degree to which the same people remain involved in key positions throughout the entire course of the project. In what ways does personnel turnover, either in the project itself or in key administrative positions in the institution, influence the development of improvement efforts?

2. Target Units/Groups

The choice here is essentially at whom to direct the thrust of the information utilization effort. Several dimensions are important here:

- Scope of Target. This refers to the degree to which the initiative is aimed at influencing all units in the institution or only a narrow range of such units. Is the effort, for example, aimed primarily at academic or at student service units? At what level?

- Specificity of Objective. This refers to the type of change aimed at particular target groups. Is the objective to change particular, identified actions or policies, to change an operating style, or to change broad attitudes toward the use and value of outcomes information?

3. Integration of the Change Effort with Ongoing Activities

The choice here is how completely to distinguish institutional improvement activities from regular, ongoing institutional activities. On the one hand, a distinct set of activities may heighten consciousness of the improvement effort on campus. On the other hand, changes made as a result of such an initiative may turn out to be surface changes--not penetrating to the level of actual organizational practice. Again, several dimensions of this choice are relevant:

- Distinctiveness of Objective. This refers to the degree to which the objective of the initiative is already an established institutional or unit objective. If the objective is to improve existing ongoing processes through inclusion of effectiveness information, related activities may be fairly difficult to distinguish from other activities directed toward similar ends. If, on the other hand, the objective is a new one, the activities undertaken may be easily distinguishable from other institutional activities. This will also be true for objectives for which no explicit unit responsibility is currently assigned.

- Distinctiveness of Image. In contrast to the above, this refers to the perception of the change effort on campus as a distinct, separate activity. Is the initiative seen as a way to accomplish an identified, distinct objective? Or is it rather seen as a source of support for an internal unit or campus initiative?

- Relation to Established Lines of Authority. This refers to the degree to which the organization of the change effort follows or cuts

across the institution's established patterns of authority and organization. How much cooperation among distinct administrative areas is required and achieved? What is the function of special bodies and committees that cut across regular lines of authority? What informal mechanisms for promoting inter-unit cooperation are available and employed?

4. Problem Orientation

The choice here is the degree to which the objectives of the change effort are tied to an explicit, identifiable campus issue or problem. Linking the goals of the initiative with particular campus problems may have the substantial advantages of harnessing the perceived urgency of the problem and of providing an explicit focus for particular activities. On the other hand, linking project objectives to an explicit problem may involve the substantial cost of losing momentum toward more general data use once the problem selected goes away. To the degree a particular data-use initiative is problem directed, it is useful to distinguish several dimensions of the problem:

- Permanence of Problem. This refers to the degree to which the problem as posed can be solved within the terms and time-span of the project. Most problems will have elements with at least some short-term solutions.

- Source of Problem. This refers to the degree to which the problem is externally imposed upon the institution. If the source of the problem is external, the change effort may obtain a great deal of leverage from that fact. A major question, then, will be how to

internalize this leverage when external pressure is no longer a factor.

An Initial "Database" for Institutional Comparison

Documenting Patterns of Institutional Experience

As noted above, there are relatively few well documented current cases of institutions attempting to implement explicit instructional improvement programs on the basis of effectiveness information. One of the few sets of institutions available is a group of 22 colleges and universities participating in the operations and dissemination phases of a four-year national project on the use of student outcomes information in institutional program planning and decisionmaking (Ewell 1984b). Beginning in 1981, seven public institutions participated in the project--each institution undertaking an explicit problem-centered effort to use existing information on student learning and development. This core group of institutions was joined in 1984 by an additional fifteen public colleges and universities each undertaking a similar effort.

Although intended as a consulting-based institutional change project, NCHEMS staff collected considerable research data in the course of the project. Each year, both local project personnel and NCHEMS consultants prepared extensive debriefing reports on campus activities using a defined common format (see Appendix A). Questions in the debriefing report covered not only practical problems encountered, but also included many items that the literature on information utilization suggested might be important contextual variables. In addition, at the conclusion of the three-year effort, faculty and administrators at the seven original sites were interviewed using a formal,

open-ended interview schedule (Appendix A). Ten to twelve interviews were conducted on each campus and the results were compiled for later research use. The same procedures are being used to document the progress of the fifteen dissemination institutions whose information-utilization projects are still in process. The result of these documentation efforts is a rich initial "database" for investigating patterns of success among such institutional change efforts. The twenty-two cases covered, all public institutions, range in size and type from a small, rural community college with an enrollment of less than 2000, to a large, "flagship" research university with an enrollment of over 25,000. While the number of institutions is admittedly few, reviewing some of their experiences in the light of an explicit conceptual framework should prove helpful to more formal investigations as greater numbers of cases become available.

The balance of this section consists of eight brief case reviews drawn from this initial "database"--each of which illustrates a particular pattern of interaction between campus environment and the successful utilization of assessment information to induce change. The major features of each institution discussed are documented in Chart 1. Because information utilization was in each case conditioned by complex patterns of institutional culture and local political conditions, the individual identities of each of the institutions discussed are protected by pseudonyms.

While the interactions among the many factors conditioning information use are complex, an initial attempt at classifying each case discussed was made using the conceptual scheme presented in the previous section. These results are presented in Chart 2. The pattern of classifications for each case in Chart 2

Chart 1

Features of Case Institutions

Name	Type	Location	FTE Enrollment
Frontier State University	Public Research	Rural	10,100
Midstate University	Public Research	Urban/Suburban	15,500
Sunkist Community College	Public Two-Year	Urban	14,500
Vista Community College	Public Two-Year	Suburban	10,300
Heartland State University	Public Comprehensive	Rural	6,700
Coldspring State University	Public Comprehensive	Rural/Suburban	15,900
Southern State University	Public Research	Urban/Suburban	19,500
Central University	Public Research	Urban/Suburban	30,200

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Chart 2

Conceptual "Profiles" of Eight Case Institutions

	Frontier State	Midstate Univ.	Sunkist Community College	Vista Community College	Heartland State	Coldspring State	Southern State	Central Univ.
Institutional Context:								
1. Institutional "Demographics" (see Chart 1)	--	--	--	--	--	--	--	--
2. Centralization of Decisionmaking								
- Mission Solidarity	High	Med.	High	High	Med.	Low	Med.	Med.
- Locus of Decisionmaking	Low	Low	High	Med.	High	Med.	High/Low*	Low
3. Institutional Flexibility								
- Decision Latitude	High	Low	High	High	Med.	Med.	Low	Med.
- Resource Flexibility	Med.	Low	High	Low	Low	Low	Med.	Med.
- Orientation Toward Innovation	High	Low	Med.	High	High	Med.	Low	Med.
Use of Information in Decisionmaking:								
1. Quality/Extent of Information	Med.	High	Low	High	Med.	Low	High	High
2. Locus/Control of Information								
- Information Centralization	Low	High	High	High	High	Low	High	Med.
- Information Availability	Med.	Low	Low	High	Med.	Low	Low	High
3. Receptivity of Decisionmakers	Med.	Low	Med.	High	Med.	Low	Low	Med.
4. Pressure for Use by Top Administrators								
- Nature of Incentive	Positive	Negative	Negative	Positive	Mixed	Negative	Negative	Positive
- Delegation of Authority	High	Low	Low	High	Low	Med.	Low	High/Low*
- Degree of Follow-Up	Low	High	High	High	Med.	Low	Low	High
Change Strategy Dimensions:								
1. Unit "Change-Agent" Characteristics								
- Proximity to Locus of Decision	Med.	Med.	High	High	High	High	Low	High
- Unit Resources Available	Med.	Low	Low	High	Low	Low	Med.	High
- Unit Resources Utilized	Med.	High	High	High	High	Low	High	High
- Stability of Primary Actors	High	High	High	High	High	High	Low	High
2. Target Units/Groups								
- Scope of Target	Broad	Broad	Broad	Broad	Broad	Broad	Narrow	Med.
- Specificity of Objective	Low	Low	High	Low	Med.	High	High	High
3. Integration with Ongoing Activities								
- Distinctiveness of Objective	Low	Low	Low	Low	High	Med.	High	Med.
- Distinctiveness of Image	Med.	Low	Low	High	High	High	Med.	High
- Relation to Established Lines of Authority	Low	High	High	High	High	High	Low	High
4. Problem Orientation								
- Permanence of Problem	Low	Med.	Low	Low	High	Med.	Low	Med.
- Source of Problem	Internal	Internal	External	Internal	Internal	External	External	External

serves as a useful organizing principle for both discussing individual cases, and for noting some broad interactions among the various variable dimensions.

Some Cases

Patterns of experiences in Chart 2, of course, can only begin to document the complexities of interaction between campus environment and information utilization that occurred at each institution. As a result, the following brief reviews of particular cases attempt to highlight the dominant pattern of relationships and to note the ways in which particular operational "syndromes" were present. Cases are presented in pairs in order to emphasize a particular contrast in approach, and the institutions in each pair are roughly comparable in size, type, and mission orientation. Each case presentation will approximately follow the logic of Chart 2 by presenting (1) the basic "demographics" of the institution, (2) the general role of information in decisionmaking, (3) the kinds of "change strategies" employed by the institution, and (4) the kinds of changes actually accomplished and the impact of information in the change process. All variables in 1-3 are reported as of the beginning of the change effort. In some cases, the pattern of these variables changed as a result of the effort itself.

Information Utilization and Unit Entrepreneurship

Frontier State University is a medium-sized residential land-grant institution serving a total student population of approximately 10,000 (8500 undergraduate and 1500 graduate students). The array of programs is considerable and includes such areas as engineering, agriculture, architecture, veterinary medicine, and forestry as well as business and the traditional array of liberal

arts disciplines. Students are largely traditional, full-time, live on campus, and are drawn predominantly from within the state.

Mission distinctiveness and mission solidarity are considerable at Frontier State; most faculty and administrators see the institution as a unique environment with its own lifestyle and campus culture. Most are at the institution by choice, and would feel uncomfortable in a different environment. Most decisionmaking is informal--either entrepreneurial or consensual. Individual units have considerable decision latitude to establish and implement their own policies. At the same time, much informal communication and coordination between units themselves and with campus administration occurs informally through a network of assistant deans and such "information brokers" as the Director of Institutional Research.

Partly as a result of this pattern, information use is mixed at Frontier State. The quality of centralized information resources--for example, the registration database--is extremely low, and is currently under review. But most departments and units tend to keep a good deal of their own information. At the same time, individual unit decisionmakers vary considerably in their approach to and use of information. In the Engineering School, for example, the collection and use of local information about students is considerable. The President is also positively oriented toward information, but more as a device to package and sell decisions than as a major aid to decisionmaking.

The essence of the University's change strategy was a combination of positive incentive and unit initiative. Two efforts were central. First, the Office of Institutional Research--the locus of the effort--attempted to locate, document, and make available for use a wide range of student-outcomes studies accomplished across the campus. Secondly, small amounts of incentive funds

were made available to individual units in the form of "mini-grants" to undertake local information-use projects. Twelve such projects were funded, the most successful of which involved the use of student success data to prepare improved recruitment materials that stressed the need for prospective students to take an appropriate pattern of college preparatory courses while in high school.

Long-term results of the effort were mixed. Reliance on unit initiative meant that (1) many units did not become involved, and (2) many that did decided not to pursue the effort after encountering initial difficulties. Nevertheless, some useful short-term products resulted. Because the effort was driven by local problems and positive incentives, and because it depended upon local motivation, those units that elected to proceed with an initiative generally did so successfully. But no formal or ongoing mechanism to ensure that information could again be used emerged. The utilization effort tended to stop with the perceived "solution" of the problem motivating involvement.

Effectiveness Information in a Formalized Process

Midstate University is one of several major research universities in a multi-campus state system. It currently enrolls about 15,000 students, approximately 12,000 of whom are undergraduates, and maintains a strong traditional array of graduate and research programs. The undergraduate student population (residential and traditional) is recruited selectively, and is drawn primarily from the major city in the state.

Like Frontier State, Midstate has a strong sense of institutional distinctiveness--particularly in the institution's research mission--and a self-image of high quality is an important element of institutional identity.

Unlike its counterpart, however, a recent retrenchment produced a strong presidency and a formal, highly participatory institutional planning process for setting institutional funding priorities. Hard, quantitative information on unit costs, markets, and enrollments plays a prominent part in the planning process. The use of information has been encouraged by the institution's current President--a quantitative social scientist with a strong personal interest in and affinity for policy data. It is also supported by a high quality institutional research staff that conduct a wide range of policy studies. The results of such studies, however, have not in general been widely disseminated nor extensively used by unit-level administrators.

In contrast to Frontier State, the change effort at Midstate was both centralized and formal. Beginning in 1982, results of a number of student performance studies (most notably a survey of alumni that noted graduate school attendance and persistence, professional placement and development, and retrospective ratings on several dimensions of the quality of instruction received) were included along with enrollment and cost criteria, in the annual planning/budgeting process. As part of this process, units were required to speak to their strengths and weaknesses as revealed by these data, and to propose plans for the coming year accordingly.

Because the use of data on performance was centrally sanctioned and incorporated in a formal decision process, it was guaranteed attention. Few units chose not to cooperate. But because the effort was seen as external to the units, and was not problem-based, real utilization of the information beyond "compliance" tended initially to be limited. Units initially used information effectively only as they surfaced ways the information might help them deal with a particular, local issue. Unlike Frontier State, however, a

permanent mechanism for utilization was established to support such efforts on an ongoing basis. Perhaps as important, individual unit heads reported that the inclusion of such information in the formal process served as an unambiguous "signal" that the central administration valued effective undergraduate instruction.

"Top-Down" Utilization in a Community College Setting

Sunkist Community College is a three-campus community college serving some 14,000 headcount students in a major urban area. The college's programs are wide-ranging, and include a substantial baccalaureate transfer component, community service programming, and a strongly supported array of one and two-year occupational programs. Students are a typical community college commuting population, although Sunkist has a higher proportion of traditionally aged full-time students than many other institutions of its type. The college is supported by a combination of state and local tax revenues, and the President is largely concerned with external relations, and the maintenance of support from the Board. Day-to-day operations at the institution are handled by a central office staffed by three young, active Vice-Presidents, and the three campus Provosts.

Decisionmaking at Sunkist tends to be highly centralized. The mechanics of the budgetmaking and curricular design processes are closely held by the central office, and many decisions are made informally among the six primary actors. Information has been increasingly valued in the decisionmaking process, but obtaining good information has been a problem. Registration databases were in the past not well maintained, and timely, reliable information on enrollments was often not available. Recently, through the initiative of the Vice-Presidents and the management team, this has begun to change. Substantial

investments have been made in improving data completeness and in developing new computer software to track student progress. A registration/admissions "task force" composed primarily of administrators recently designed an interactive MIS for registering, placing and counseling students. Plans are also in place for an automated degree audit to be implemented as part of this system.

The use of instructional effectiveness information at Sunkist was stimulated by an announcement that the state community college system would soon embark on a program of systematic program review. The management team at Sunkist saw this event as an excellent opportunity to develop a local program review effort--a process that might then be adopted by the state as a model. External consultants were hired to help design the process, which included a two-tiered review effort and a substantial amount of external data gathering. Among the data collected were extensive interviews with area employers that emphasized the need for and performance of Sunkist students in various occupations. The process adopted also involved creation of a faculty review committee empowered to make recommendations on program direction--the first such body in the institution's history.

Programs chosen for review in the initial year included many that the management team felt were weak and needed redirection or closing. Three such programs--Hospitality Management, Fashion Merchandising, and Social Work--were thought to be particularly weak. Available data allowed discussions of the future of these programs to be undertaken in a manner quite different from former practice at Sunkist: faculty were given the chance to make their best case for a program, and then weigh the available evidence about its effectiveness. One program was terminated and another redirected. A third,

however, was supported after previously unarticulated evidence of effectiveness was compiled and discussed.

Because of its "top-down" culture, information utilization at Sunkist was first seen as a management initiative. Faculty were reluctant to participate in the process and felt inadequate in doing so. Indeed, the initiative was seen--partly correctly--as an attempt by administration to kill some undesirable programs. Because faculty were included in the effort, and because information was openly shared, however, the process was gradually seen as legitimate. Adoption of the Sunkist model by the state also helped enhance the program's credibility. As a result, a small but central core group of faculty was "socialized" into the decisionmaking process. Many of that group are currently at work on a much larger initiative--the use of student tracking and test score data to evaluate curriculum effectiveness.

"Bottom-Up" Utilization in a Community College Setting

Demographically similar to Sunkist, Vista Community College is a multi-campus institution in a growing suburb of a major city. Although its clientele is slightly older and more part-time than that of its counterpart, its array of programs, size, and funding mechanisms are all quite similar. Institutional culture and decisionmaking styles, however, are quite distinctive at Vista. Led for the past decade by a dynamic president, Vista is continually experimenting with innovative management processes--most of them highly participatory. Over the years, for example, Vista has used focus groups, "quality circles," and other such techniques to raise issues about the institution's future and current performance. The pace, however, can be frenetic; indeed some participants feel that an atmosphere of constant change and endless dialogue may get in the way of attaining real effectiveness.

Vista has invested heavily in management information, and has a well supported computing and information facility staffed by an open and able staff. Unlike most institutions, management information, administrative computing, and institutional research functions are combined under a single director. As a result, management information is plentiful, and its availability is facilitated by a wide-ranging computer communications network throughout the institution.

Systematic utilization of effectiveness information at Vista began with formation of an institution-wide Student Success Task Force some five years ago. Like many such ad-hoc bodies at Vista, the Task Force was large (some 40 members) and was drawn from all parts of the institution. Also like many previous efforts, the objectives and focus of the effort were initially rather difficult to pin down. Formed as a result of genuine concern about student progress throughout the institution, the charge of the committee was simply too large to get anything accomplished. Early discussions, however, eventually pointed to the need for additional concrete information about student intentions, and about student success after completion of their programs. Subcommittees of the Task Force then concentrated on each of these efforts.

At the same time, Vista's Vice President worked in parallel with the institution's management team in the routine use of outcomes information. By organizing problem-solving meetings around particular bodies of data, broken down by division and program, the Vice President slowly changed the language of decisionmaking to an information-laden language. Rather than requiring that particular bodies of information be used in particular ways, he encouraged and subtly rewarded day-to-day information use by individual members of the management team. As a result, division chairs and program directors soon began

sharing techniques with each other, and making necessary improvements in both information content and in the process of communicating information. An active "information constituency" could at this institution be adequately supported because of earlier investments in high quality equipment and management information personnel. In other settings, it might not have worked.

An Incremental Approach to Information Utilization

Heartland State University is a regional comprehensive state university located in a rural area in a midwestern state. It currently enrolls about 6500 students--the vast majority of them undergraduates--all of whom are traditionally aged, residential, and full-time. Reflecting its origins as a state teacher's college, programs are offered in education and business, as well as the full range of traditional liberal arts disciplines. Headed by a long-serving President, the institution's administrative structure is simple and stresses "low overhead" operations. Reporting to the President is a single Dean of Instruction, supported by a small staff, who administers six broad academic divisions. Department chairs are half-time appointments. Academic decisionmaking tends to be concentrated in the Dean's council, which although a collegial body, primarily concerns itself with implementing the President's policies.

Some twelve years ago, Heartland began a program of testing designed to demonstrate the national competitiveness--and hence the credibility--of its degree earners. All students are tested on graduation using nationally normed achievement tests in their major field of study. Earlier in their programs, students are tested in general education, also using nationally available standardized achievement tests. Results are compared with norms, and are used in building a case for undergraduate instructional effectiveness--both to

prospective students and to the legislature. Largely designed and initiated by the President--himself a professional educator--administration of the evaluation program is centered in the Dean's office.

When the program was begun, its focus was largely external. In several successive years, for example, Heartland was able to acquire additional funding for quality improvement from the legislature on the basis of demonstrated past and promised future student performance. But several deficiencies in curriculum uncovered by the testing program were brought to the faculty's attention and were addressed. Most notable of these was a math-across-the-curriculum initiative begun as a direct consequence of low math performance on the general education tests. Recently, however, familiarity with the data has led faculty to make increasing use of it to revise curricula and academic policies. Moreover, the testing program itself has developed incrementally since its inception. New instruments have been periodically added to the program, and the coordination of a student survey effort improved. Institutional planning and budget-building documents have gradually been modified to incorporate data as they are gathered, and utilization of information at the unit level has been aided by gradual development of a simple set of reports on various dimensions of student performance.

Four years ago, interviews with typical faculty members at Heartland revealed the testing and evaluation program to be an initiative perceived largely as an externally directed effort. Few people at the institution beyond its top leadership were actively involved. Today the situation is different. A clear majority of faculty are aware of and involved in the data utilization effort. The most recent instance of ongoing data use, for example, is provided by Heartland's science faculty, who are currently engaged in revising introductory

course sequences in the basic sciences guided by several years of general education test score results. A persistent but gradual approach to using information has resulted in a strong base of faculty support, largely because various approaches were given sufficient time to demonstrate their potential and because precipitous judgments about programs were not immediately made on the basis of fragmented evidence.

A Case of Rapid Implementation

Coldspring State University is a developing regional comprehensive college serving approximately 15,000 students. About a third of the student body is in full-time residence, with the balance commuting from two major urban areas within driving distance of the campus. Like Heartland, Coldspring State is a former teachers college, but unlike Heartland, it has grown rapidly over the past decade as the region's population has grown. The array of programs offered, however, has remained relatively stable--a set of liberal arts core disciplines with strong business and education schools that enroll a majority of the current student body.

Decisionmaking at Coldspring State is relatively decentralized, and individual school Deans have considerable latitude to manage their own units. At the same time, information is badly scattered, and there are few central foci for its collection and interpretation. Partly this is due to rapid expansion: "planning" at Coldspring State still means physical plant development, and top administrative attention has been directed largely toward the design and financing of new buildings. Nor is this attention misplaced; Coldspring has the highest classroom utilization rates in the state, and facilities are palpably inadequate to handle continued expansion. Concentrating on physical plant development and the information needed to support it, however, means that

other information functions have suffered. Reliable numbers on student progress are difficult to get and their implications remain undeveloped. Nor has top administration up to now valued information beyond that needed to manage day-to-day operations and that needed to answer questions from the board and legislature. Enrollment has never been a problem, and, because funding is largely enrollment driven, instructional effectiveness has not been a visible issue.

The impetus for change came with a new President three years ago. The current President is politically well connected, and from the beginning sought an opportunity to demonstrate innovation. Like administrators at Sunkist, he saw an opportunity in contemplated state board policies on measuring instructional outcomes. Seeking to be the lead campus in a possible statewide program, the President called for a systematic testing program aimed at end-of-year sophomore students. All such students were to be tested in math and writing skills using standardized, nationally normed test instruments as a condition of further progress.

The proposed testing program was attached to a very short timeframe. A pilot test was scheduled for an initial class of sophomores, but test results were to be actually used in promotion decisions within a year. Departmental faculty in English and Math were asked to identify appropriate instruments in conjunction with the Director of the University's Testing Center, but the decision on which tests to use was taken quickly and without broad consultation or input. More importantly, there was little opportunity to investigate the enrollment or curricular consequences of a testing program whose impact was uncertain. Early indications suggested, for example, that as many as two-thirds of current sophomores (and practically all currently enrolled minority sophomores) would

perform below a proposed cutoff score on the math examination. Public announcements of the testing program, however, were already in place. The University was thus faced with an unfortunate choice between potentially substantial enrollment losses in the upper division, and setting a cutoff score so low that the program itself would be a political embarrassment. Moreover, early results indicated that students performed quite differently on the math examination depending on the class and section taken. Clearly the University was not delivering a uniform "product" in its approach to mathematics general education, and until it did, there were few equitable grounds on the basis of which it could demand equivalent performance of all its students. Fortunately, the writing portion of the testing program was not subject to these difficulties. As a result, the University was able to proceed with this portion of the program to fulfill political promises while it rethought the math situation. A hasty attempt to implement a complex program, however, had ultimately cost the University both time and internal political good will.

A Problem-Centered Utilization Effort

Southern State University is a major land-grant institution located in the Southeast. Southern State enrolls about 19,000 students (16,000 of whom are undergraduates) and supports over a hundred academic programs varying from Textiles to Engineering. Like many institutions of its size and type, Southern State is decentralized and fragmented. Eight distinct colleges offer academic programs--each with its own policies, procedures, and admissions requirements. Student Service functions are quite distinct from academic decisionmaking, and are more centrally directed. Central direction, however, flows from the top, from the Vice Chancellor through his associates to individual unit directors.

Rarely do line personnel from each of these units routinely work together to solve common problems.

Southern State collects a considerable amount of information on student progress and performance through its Office of Institutional Research. These data, however, are not traditionally used in the decisionmaking process; indeed many school deans have essentially duplicated studies already accomplished centrally--not knowing that student tracking data are already available. The budgeting process tends to be based on individual unit bargaining; no formal institution-wide planning or program review efforts are in place.

The stimulus for systematic information use at Southern State came in 1981 with the University's need to comply with a Federal Consent Decree mandating achievement of minimum minority enrollment goals by 1986. At first, the University concentrated on recruitment to meet this goal, but it was soon apparent that a more comprehensive approach to minority enrollment management was needed. An opportunity for concentrating efforts occurred with the availability of external grant support. Under the auspices of a nationally supported project, an Southern State committee was formed to use available data on student performance to develop comprehensive minority enrollment management policies. Because the effort began in Student Affairs, members of the Committee were at first largely confined to Student Affairs personnel. Data on retention, recruitment, placement, and academic performance were considered in turn, and their implications developed. Considerable coordination among student affairs programs resulted from this process. Also, considerable use of information was made by individual unit managers in developing and evaluating the effectiveness of their own programs. But utilization of this information was rare beyond the Student Affairs area. Perceived as a "non-academic"

initiative, individual academic deans were either not aware of the effort, or ignored it.

This picture changed somewhat with a second set of initiatives--development of an integrated academic skills program centered in the Provost's office, and with the creation of a set of faculty minority coordinators to work in each college. Representatives of both initiatives were included in the committee, and its mandate was broadened. With minority success rates growing and with external grant support and visibility coming to an end, however, the utilization effort gradually became more diffuse. Looked at as a distinct "project" rather than as an ongoing effort, the change process gradually lost focus. With the accession of a new Chancellor and a consequent new set of priorities, campus administration was reorganized. Although many of the concrete improvements made as a result of the effort remain, few visible reminders of the change initiative at Southern State are visible today.

Building an "Information Culture"

Central University is a land-grant research institution serving a total of 30,000 students (including about 24,000 undergraduates) located in a mid-sized state. The University offers over 120 programs through 14 distinct colleges and schools, and routinely secures major research grants from outside agencies. Its undergraduate student population is competitively recruited from throughout the state and region, and is of traditional age, is full-time, and residential. Like most large research institutions, administration is decentralized. Recently, however, central initiatives such as strategic planning and program review have been initiated under the leadership of the Executive Vice Chancellor. Also like many large research universities, information resources have in the past been scattered. Institutional Research collects a range of

enrollment and financial data, individual schools and departments conduct studies of their own, and an independent learning support and testing unit collects considerable information on student learning and development. As a result, information utilization has in the past been both sporadic and unit-specific.

The impetus for information-based change efforts at Central came with development of a statewide incentive funding program established six years ago. In return for collecting and effectively using student performance information, institutions in the state system could qualify for considerable additional funding. At first, the motivation for collecting such information was purely instrumental, and information "utilization" was seen largely as a compliance exercise. Top administration at Central, however, quickly saw the external funding mechanism as an opportunity to build and utilize an instructional evaluation database that would provide excellent support for developing strategic planning and program review initiatives.

Coordination of data collection and utilization efforts was from the outset seen as essential at the University, and this responsibility was given to the learning support and testing unit. As a first step in building an integrated program, staff of this unit interviewed each academic dean to determine data needs and availability. Three working task forces involving faculty and administrators were then formed around different types of performance data. Each was charged with determining the kinds of instruments and data collection processes that were available, appropriate, and operationally feasible. By the end of a year, recommendations from the task forces were available, and a data collection design developed. To begin testing the design, funds were made available by the administration for individual departments to experiment with

collecting and using information. Eventually, fourteen such pilot projects were undertaken, ranging from the use of student satisfaction data in faculty evaluation to the use of cognitive testing in the major field to improve curriculum. Using lessons from the pilot project, a full-scale instructional evaluation program began two years after the effort was first conceived.

Hallmarks of the current program are central data collection and local utilization of the resulting information. Program staff compile data "profiles" of each college and school for presentation to the dean and for discussion with department chairs and faculty. They also actively promote discussion of findings and their implications as part of the annual program review process. Because of the perceived importance of statewide incentive funding to the University (now over $3 million), instructional evaluation is seen as an important and legitimate activity. But because of its development through a participatory process and the active data-based dialogues promoted by both learning research staff and the formal program review process, many department faculties also see the utility of these data to improve their own curricula and programs. As their examples convince others on the faculty that such activities have a local, departmental utility, an information constituency has developed throughout the campus. Through careful planning, appropriate involvement, and an adequate time horizon for development, what could have been a compliance exercise became instead an institution-wide program with a permanent and ongoing impact.

Some Implications

Although each of the cases described above is quite distinctive, together they illustrate a number of common principles. First, each pair of cases highlights a common tension inherent in such efforts. An institution's choice about how

to resolve each tension has much to do with the likely course its utilization effort will take in practice. Secondly, the cases as a body illustrate a number of themes present in the development of any such effort. Each of these topics will be briefly explored below.

Institutional Change Strategy as Effective Choicemaking

In attempting to put into practice information-based change, many strategies are potentially available. The strengths and weaknesses of each are inherent in the approach chosen, and also result from the appropriateness of the choice given the larger campus culture within which the change strategy must operate. Four dimensions of choice are illustrated in the cases just presented, and each represents a combination of the kinds of variables embedded in the more general conceptual scheme described earlier.

1. Centralization vs. Decentralization. Essentially this is a choice of the degree to which local initiative is encouraged in the utilization effort. As seen in the case of Frontier State, considerable involvement can be built through use of an entrepreneurial strategy, but at the cost of change being extremely uneven across the institution. Efforts such as those at Midstate will produce a more uniform result, but may take considerably more time to implement; worse still, such efforts may fail because there are no local incentives to sustain them. Good compromise positions are illustrated by Central University and Vista Community College, both of which used centrally coordinated processes, but allowed considerable unit initiative in carrying them out.

2. Problem-Centered vs. Process Centered Efforts. The literature on knowldege utilization stresses that information is most effective as an ingrediant in decisionmaking when it can be explicitly brought to bear on a shared and highly visible problem. Southern State's minority student success effort, Sunkist's attempt to remedy the deficiencies of a few already identified academic programs, and both Central State's and Coldspring State's responses to proposed statewide initiatives are all examples of the ways local problems were used to ground a more general utilization effort. These cases also show that use of a bounded problem can be a mixed blessing. Southern State's change efforts essentially ceased with the attainment of minority recruitment goals. Similarly, unit utilization of information at Frontier State rarely was generalized beyond the particular unit-level problem attracting attention. But where the problem at hand could be used as a "stepping-stone" to creating a wider utilization effort, it was successful in mobilizing attention. This was clearly the case at Central University and at Sunkist Community College.

3. Top-Down vs. Bottom-Up Management. Neither of these approaches appeared dominant in the abstract. Rather, the success of change efforts depended on the degree to which their management pattern was congruent with the more general management style of the institution. At Sunkist, a "top-down" approach was expected by the faculty and worked well. At Vista and Frontier State, the opposite was the case. At Central University and Coldspring State, however, the change efforts represented a more "top-down" approach than was typical on these large, decentralized campuses. Their differences in success were due largely to the relative amounts of time allowed for the

effort--in the case of Central University a considerable length of time, and for Coldspring State an extremely short one.

4. Long-term vs. Short-term Approaches. Change efforts with careful planning and plenty of time for execution generally worked better than those that were implemented on a short time-frame. Central University and Heartland both involved plenty of opportunity for pilot testing of policies before implementation, and allowed the interests of all parties to be heard and to be potentially incorporated into policy. Coldspring State's efforts did not enjoy this luxury. But short time-frame efforts also worked in the right settings. Sunkist's program review effort was developed quite quickly, and Southern State was able to field programs within a year. In the first case this was due to the ability of a centralized administration to move quickly and legitimately to create and implement a new program. In the second, it was due to the percieved urgency of a common institutional problem. Neither of these mitigating conditions was present at Coldspring State.

Some Common Themes of Information Use

While each of the cases discussed represents a different pattern of choices with regard to the four tensions outlined above, all illustrate the efficacy of some common themes of information use. A first theme is one of gradually building participation through changing patterns of individual administrative behavior. In all eight cases, faculty and most administrators were initially indifferent to or actively opposed to gathering and using performance information. A first step in changing this situation involved altering the parameters within which administrators operated--either through direct changes

in the incentive or constraint structure, or through changes in the official language of institutional discourse. For example, Midstate's use of a well-established planning process for institutional budgetmaking, Central's use of incentive funds and program review findings, and Sunkist's establishment of an explicit program modification and discontinuance process all used the institution's formal authority structure to induce different kinds of behavior. In the case of Central and Frontier State, moreover, fiscal incentives for different kinds of behavior were also present. Furthermore, Midstate, Central, Heartland, and Vista all illustrate the importance of central administration encouraging the consistent use of performance information as an institution's official "language" of planning. Use of this language was instrumentally encouraged and rewarded until those who used it began themselves to see its utility in improving their own units and departments. Through a gradual process of explicitly modifying language and behavior, changes gradually became internalized, creating an active, ongoing "information constituency" on each campus.

A second theme, however, conditions the operation of this mechanism: the process of building participation must be carefully matched to the parameters of a particular institutional culture. Some cultures--such as that at Frontier State and Vista Community College--are suffiently distinctive that the entire shape of the utilization process must be tailored to fit it. In cases where the campus culture was already undergoing change, for example Central University and Midstate--both of which were in the process of becoming more centralized, the information utilization effort could be coupled with a larger, more legitimate change process. But in cases where the utilization effort was largely incongruent with existing campus culture, the result was to considerably temper success. For example at Southern State an initiative

perceived as being a "student affairs" effort that stressed coordinated effort was strongly at odds with both the decentralized tradition of academic decsisionmaking, and the faculty's disdain for "development" functions.

A third theme is the use of an externally imposed requirement or an internal problem as a starting point for information utilization. Both can serve as powerful levers for mobilizing attention and action in the early stages of an improvement effort. But these cases also illustrate the many opportunities for the effort itself to become trapped by the parameters of the problem. At Southern State, attainment of "real" objectives ultimately deflated the perceived need for ongoing information utilization. With the onset of a new problem, a whole new set of response mechanisms will need to be developed. At Central University and Sunkist Community College, however, response to external mandates allowed administration to develop an institutional process with considerably greater legitimacy and decision latitude than would otherwise have been the case. While the short-term problem mobilized attention, the process that was built around it was gradually allowed to shape behavior. At Midstate and Vista Community College, in contrast, the lack of an urgent, generally recognized problem meant that similar processes took a good deal of time to get started. The implication for institutional practice is that use of a problem as an initial focus for a change effort is a useful device, but that if the effort remains problem or compliance-driven, it will not stick.

Finally, all three of the above themes function within a fourth--the importance of sufficient time for incremental development and modification. A primary danger of time pressure is that it eliminates the subtle consensus building of the first mechanism. Building an "information constituency" at Coldspring State was impossible overnight. At Sunkist, moreover, initial compliance with

the results of the program review process was not because of its percieved utility or legitmacy; rather it was because such compliance was consistent with the institution's traditional "top-down" management style. Unfocused by the presence of a particular problem, both Visa Community College and Midstate showed no explicit "progress" in their programs a year after initiation. Both would have been declared "failures" if sufficient time had not been allowed for incremental changes in administrative behavior and attitudes to develop.

If recent calls for information-based improvement are to be effectively implemented, a great deal more understanding will need to be built about what makes such efforts successful and unsuccessful in particular campus environments. Based on a few emerging cases, this review suggests some directions for such an inquiry. Because information-based change is complex, the inquiry itself will be complex, and must take into account many local variations in information type and campus culture. As more campuses experiment with such approaches, however, the database of experience will grow, and the generalizeability of these results can be more thoroughly explored.

Appendix A

FORMAT FOR CAMPUS PROJECT CONSULTING REPORT

NCHEMS/KELLOGG STUDENT OUTCOMES PROJECT

A. Institutional Setting:

The basic purpose of this section is to present salient features of the institution within which the particular campus project is housed. The attempt is to classify the institution along a few key decisionmaking dimensions so that we can make appropriate generalizations based on project results. The questions here are basically the same as the ones we used last year, so it may only be necessary to update your observations at that time.

1. Institutional Profile:

(This section will include basic institutional "demographics" such as size, type, location, program array, and recent history; I include it here to indicate that we are certainly going to pay attention to this as part of Institutional Setting.)

2. Institutional Mission:

Does the institution have a clear sense of its own mission or central direction? Is this well communicated to or shared by mid-level administative staff and faculty members? If you asked the question of mission to different kinds of people on campus, what kinds of answers do you think you would get from whom? Does the institution have a strong "personality"? In what ways does it see itself as unique or distinctive?

3. Decisionmaking "Style":

Is the institution basically run in a centralized or a decentralized manner? How much authority do individual unit heads appear to have to make their own decisions and control their own resources? Are they allowed to take risks? In what areas? Are lines of authority clear or fuzzy? How do changes generally get made on this campus?

4. Institutional Flexibility:

Is the institution under notable external pressure--either financial or for accountability? Has it experienced significant retrenchment in the past five years? Is financial pressure a common topic of conversation among faculty and staff? Aside from finances, how much decision latitude does the institution appear to have in its relations with higher authority (state system, state coordinating board, governing board, etc.). Have any of these external factors changed notably in the course of the project period?

5. Information Use and Availability:

What do you see as the role of information generally in making decisions on this campus? What are the main problems or advantages this institution has in getting information communicated to key decisionmakers? What are the incentives/rewards for use of information? Where is information generally located and who controls or has access to it? What is the attitude of the chief executive toward information?

6. Special Resources and Opportunities:

Are there unique features of the campus environment which make it particularly effective in promoting the use of information in decisionmaking? For example, are there particular individual talents, computer resources, information resources, or analytical resources available which would probably not be available to an otherwise comparable campus? What would have to be transported over to an otherwise comparable campus to duplicate what happened on the project campus?

B. Project Structure and Basic Strategy:

The purpose of this section is to block out some major dimensions of information utilization efforts which I think are common to all campuses. Like the above, the attempt is to broadly classify particular efforts for ease of generalization. Seven cases are far too few to seriously propose a "matrix" of project dimensions by institutional dimensions, but the image of such a matrix has been of help to me in trying to sort through the many things that have happened.

1. Unit Context:

What is the administrative and political setting of the particular unit within which the campus project is housed? What is the campus project director's administrative and political position? How much and in what areas can he/she act independently to accomplish change? What approvals and alliances are necessary to get something moving? What difference do you think it makes to the project on campus that

it was housed in this particular unit? Has this affected the way the project has been viewed on campus?

2. Project Centralization:

Where has the initiative for project activities rested? Has the project consisted of a centrally-directed set of activities--perhaps carried out by others in the institution--or has it rather consisted of many independent, loosely coordinated efforts? How reactive have project leaders been to events at lower levels? Has project direction shifted many times as new issues or opportunities arose, or was a basic, established agenda pretty much carried out from beginning to end?

3. Target Units/Groups:

At whom or what was the project primarily directed? Whose behavior were the project leaders trying to change? Was the attempted change intended to be institution-wide, or initially only directed at particular types of units or individuals? What level of change was aimed at--broad changes in institutional policies and procedures or more narrowly targeted changes such as curricular changes or changes in admissions policies, counseling procedures, etc.? How did these targets shift as the project developed? Where were the initial "successes" achieved, and how were these exploited or not exploited?

4. Project "Independence":

To what extent was the project structured and implemented as an independent, free-standing effort distinct from other institutional

structures and processes? Did the structure of the project "cross-cut" existing lines of authority and responsibility? Did it represent an innovative use of existing structures, processes, or lines of authority? If you asked most people at the institution, would they be able to distinguish "project" activities from "non-project" activities of the same general type? What difference do you think this made?

5. Problem Orientation:

How strong was the link between the campus project and a specific, identified campus issue or problem? Did most people involved on campus see the project as an "information utilization project" or rather as a "retention" project, a "planning/program review" project, an "accountability/compliance" project or whatever? What labels were actually used to describe the project on campus? How did the problem focus enhance or inhibit the project's general effectiveness in promoting better information use?

6. Kellogg Roles:

What is your assessment of the "symbolic" role of the project on campus? Has the recognition of being part of a multi-institutional project funded by a large foundation meant that these resources are having a greater (or different) impact than if institutional resources in the same amounts were directly applied to the problem? Has the institution made use of its "Kellogg Identity" in any ways that go beyond the project?

C. Project Activities:

We will be receiving what I expect to be fairly complete documentation of individual campus project activities with the final reports required of each campus. What we need in addition is an external view of the effectiveness of these activities and some of their "flavor." The intent of the following is to get at some of these more interpretive questions rather than to serve as complete documentation for what happened.

1. Major Activities and Accomplishments:

Briefly review the significant activities and accomplishments of the project. What accomplishments were direct consequences and what were indirect consequences of project activities? From your own point of view, which of these were the most significant and which were the most disappointing? How much of what occurred probably would have occurred had there been no Kellogg Project?

2. Role of Project Oversight Committee:

How strong a role did the project steering committee play in the project? Was it a necessary part of the project or could (or did) the project pretty much go on without it? What role, if any, did the committee in (a) heightening the visibility of the project on campus, (b) increasing communication/coordination between key players, and (c) providing additional perspectives in terms of which to develop the implications of outcomes information? Based on this campus experience, how important is it to insist on the presence of such a committee in an information utilization project?

3. Consultant Role:

What is the best way of characterizing your role as a consultant at this institution? Have you been primarily a technical expert? A facilitator for identifying problems and bringing people together? An observer/researcher documenting what the institution is doing on its own? A monitor/evaluator from a funding source? How have these various roles developed or changed as the project has progressed? Which of them have been most successful? What is your best (detached and modest) guess as to what would have happened in the project had you not been around? Based on this campus experience, how important does external consultation appear to be in launching and carrying through an information utilization project?

4. Project Timing:

Was two years a realistic time frame to get something like this accomplished? If the project had been cut off at the end of the first year, what would there be to show for it? If the project had continued on for another two years with the same level of external resources, would the impact have been greater or more permanent? Did the project seem to develop in terms of identifiable periods or phases? How distinct were these and what was their sequence and duration? Based on this campus experience, should we re-think the time-frame for a campus-wide information utilization project?

5. Prognosis:

What do you expect these activities to look like a year from now? What efforts are currently being made to "regularlize" project

activities and to assign project responsibilities to existing campus units, committees, and processes? What do you think their fate is likely to be?

6. <u>In Retrospect</u>:

Given the situation, the resources and the setting, was all done that could have been done? In retrospect, what actions or initiatives could realistically have been undertaken to enhance the effectiveness of the project? Looking back, were there any decisive incidents or moments when a new direction could have been taken?

DRAFT PROJECT ASSESSMENT INTERVIEW SCHEDULE

NCHEMS/KELLOGG STUDENT OUTCOMES PROJECT

PROJECT GOALS:

1. In one or two sentences, how would you describe the goals of the Kellogg Project at _____? What was the project trying to accomplish? [If not sure, give brief description of overall project goals and some examples of campus project activities.]

2. How important do you feel these goals are on this campus at present? Did the project deal with issues or problems that were crucial and visible, interesting but relatively unimportant, or of little interest or salience?

PROJECT IMPACT:

3. Thinking about the various activities undertaken through the project, what from your point of view have been the three most significant accomplishments? [May want to probe following areas: changes in academic policies, changes in curriculum or instructional practices, changes in student service programs, changes in administrative procedures, or changes in knowledge about or attitudes toward students.]

4. What have been the three greatest dissapointments or setbacks?

5. Can you identify any <u>specific</u> changes in policies, procedures, or programs which occurred as a result of the project? Describe the nature of each change, where it was located, and how it came about. What further changes are <u>planned</u> as a result of the project?

6. What new kinds of information about students have been generated or made available to you and others as a result of the project? How, if at all, have you used this information? Have you done anything differently as a result of having such information?

PROJECT ENVIRONMENT:

7. Thinking again about the major accomplishments and major dissapointments of the project which you identified earlier [remind if necessary]. What factors in the environment at _____ do you feel were generally responsible for what occurred? [May want to probe following areas: Top-level administrative commitment, key people or resources, size and complexity of institution, salience of problem being addressed, particular strategy employed to disseminate or collect information, etc.]

8. Briefly describe any important events over the last three years which you feel may have had an impact on the way the Kellogg Project developed on campus.

9. Who have been the greatest supporters of this project on campus [positions, responsibilities, reporting lines]? How have they provided support and how effective has it been in achieving the goals of the project?

10. Can you think of anything else we ought to know about the way the project has developed here at _____?

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